

# American Cinematographer

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## *In This Issue*

Shooting Sheik-Stuff on the Sahara Desert

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By Gene Kornman

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## TITLE

## PHOTOGRAPHED BY

A Girl of the Lumberlost

Henry Sharp, member A. S. C.  
and Howard Anderson

The Rejected Woman

Roy Hunt

Torment

Arthur Todd

The Circus Cowboy

Joseph Brotherton, member A. S. C.

The Moral Sinners

William Miller

Forty Horse Hawkins

Virgil Miller

What Three Men Wanted

Not Credited

Triumph

Best Glennon, member A. S. C.

The Galloping Fish

Max DuPont, member A. S. C.

Listen, Lester

John Stumar, member A. S. C.

\$20 a Week

Harry Fischbeck

Riders Up

Ben Reynolds

The Martyr Sex

Roland Price

Chastity

Joseph Brotherton, member A. S. C.

Bluff

Alfred Gilks, member A. S. C.

Flapper Wives

King Gray, member A. S. C.

Ridgeway of Montana

Harry Neuman

Pagan Passions

Joseph Brotherton, member A. S. C.

Pal O' Mine

Not Credited

The Lone Wolf

Jack Brown

Sherlock, Jr.

Byron Houck and Elgin Lessley

The Dangerous Blonde

Jackson J. Rose, member A. S. C.

The Goldfish

Ray Binger

Midnight

Oliver March

# American Cinematographer

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# Solving the Stills Problem

By Gene Korman

Staff Still Photographer  
Is Solution. Responsibility  
of Cinematographer Relieved.

In the March issue of the *American Cinematographer*, the writer had the pleasure to read, under the head of "Urgent Need for Good Publicity Stills," an enlightening article on what was described as the present-day status of still photography. He had previously read Florence Lawrence's article in the *Los Angeles Examiner* that furnished the subject on the still discussion in this publication.

## Must Be Fixed

To one who has gained knowledge through extended experience in matters of stills in motion picture studios, the fact is quite evident, as was pointed out in the March issue, that the only way to obtain effective stills is to fix responsibility for them in some one definite quarter.

## One Department

The foregoing may seem rather elementary and not worthy of serious consideration, especially as to the fixing of responsibility. Anybody, it might be said, who is capable of making a still may be held responsible for it. True enough, but stipulate the premise that capability to make a still is a condition precedent to responsibility therefor, yet there is only one sure method of actually pinning down the responsibility for good or bad stills—and that is to have one department, or, more practically, one person and one person alone answerable for the stills and the stills alone.

Again, we may repeat, the foregoing may appear to be too elementary to be worthy of serious consideration. But elementary things, like great inventions, very often go along obscured in their own simplicity before their basic truth is eventually recognized.

## Has Enough Duties

When we say to make some one responsible for stills and stills alone in the filming of a production, we do not mean that this phase of picture making should be unloaded on the cinematographer as has been a more or less general practice. The cinematographer has a big enough job of his own to attend to the motion photography of the picture in question without making his burden excessive in assigning the making of stills to him.

## Cinematographer Needs Time

When he is through with the actual shooting of one scene, he should be left free to make the very necessary arrangements for the filming of the next scene—he should be given ample time to set up in the proper angles and to arrange his lights without being rushed. But he cannot do this, if he must, between the end of one scene and the beginning of another, "sandwich" in the shooting of the stills that are to be broadcast throughout the world to exploit and publicize the production on which he is working.

## Cannot Serve Two Masters

Certainly such a program is not conducive to superior cinematography. The cinematographer, who is not given sufficient time to properly arrange his lights and to do properly the little things that he would like to do before actually shooting, cannot be expected to turn out a grade of photography at which the critics will marvel. In short, if the cinematographer must be bothered with stills, his cinematography must suffer accordingly. And

when the cinematography suffers, every one in the cast suffers; not does the evil end with the cast—it extends quite naturally, if imperceptibly, to the director, the producer and all those whose reputations or money are, to a comparative degree, at stake in proportion to the measure of success that the picture in question will enjoy.

## Haste Makes Bad Stills

But wherever the cinematography is injured by overburdening the cinematographer, the grade of stills, which he must take "on a fly," is many more degrees below par. Put yourself in the cinematographer's shoes. If you were worrying about the illumination for the next scene, if you were thinking hard as to the best cinematographic treatment for the coming episode, don't you think that you would get through the taking of stills as rapidly as possible so as to have every available bit of time in which to make the necessary preparations for the subsequent sequence's cinematography?

## Reputation Based on Cinematography

After all, the cinematographer's reputation is based upon the cinematography that he produces—and not upon the stills that he snaps during the time that he isn't producing cinematography. It is no more than reasonable, therefore, for him to give every possible bit of attention to his cinematography—even if at the expense of the intermittent still-making which he imposed upon him.

## Staff Still Photographer

But to whom will these companies, whose cinematographers make their stills, turn if the cinematographer does not make them? Their solution is very simple. It lies in the direction already followed by progressive production organizations—add a capable still man to the company staff, make him and him alone responsible for the stills.

With such an arrangement, the cinematographer is relieved of unnecessary pressure, and the way is opened for well-taken stills. But you must observe that the suggestion provides that it shall be a competent still photographer who should be annexed to the staff. Incompetent still photographers can work just as much harm as incompetent cameramen.

## Mind at Ease

His job being to take good stills, the still photographer, other conditions not being combative, may center his entire attention thereon, instead of worrying himself about getting on to the filming of the next scene as the cinematographer perforce must do. Not only that, the still photographer, once he has made his negative, can give its development his personal attention and not carry with him the extra worry of the handling of hundreds of feet of motion picture negative.

## Asset to Publicity Department

Aside from these very fundamental evidences, the still photographer who knows his business thoroughly is a great help to his company's publicity department if for no other reason than, unlike the cinematographer, he has more time to work with the publicists on what is needed in the way of stills. Ask any publicity department.

(Continued on page 17)

# Shooting Sheik-Stuff on the Sahara Desert

A. S. C. Member Spends  
Five Weeks in Filming Pro-  
duction on African Desert.

By Robert Kurrle, A. S. C.

Photographic Conditions  
Described. Picture Fin-  
ished at Eclair, Epinay.



Robert Kurrle, A. S. C., (left) Al Green standing, and Wallace Fox, assistant director, "set up" on the Sahara. Partial view, on the left, of hundreds of camels, and, on the right, of the tents of Arabs, photographed by Kurrle.

"Sheik" motion picture productions have proved great sources of entertainment to American audiences, but the making of such productions, when the filming entails working in the actual locale in the Sahara desert, is not such an amusing experience to those cinema workers on the vehicle in question. This fact was bountifully learned by the members of Edwin Carewe's company and staff which made the First National production, "A Son of the Sahara," which is just being released throughout the country.

## Five Weeks On Sahara

To give authentic scenes to "A Son of the Sahara," five weeks were spent on the great African desert during which time we filmed 70,000 feet of negative. To photograph this production we were called upon to cope with conditions with which we were not familiar; and in so doing we could not, cinematographically, make mistakes, and then "charge them up to experience" as well as to the cost of the production. To the contrary, the cinematographer had to be prepared to foresee results, to judge which he did not have precedent to guide him.

## Not One Bad Scene

That we were successful in our survey of what we had to do may be indicated by the fact that in all of the 70,000 feet of negative that we exposed there was not a single bad scene. Moreover, we did not view the projection of even one of these scenes all the while we were on the desert, our first glimpse coming after we had left the Sahara and arrived in Paris. However, we did not for a minute relax our vigilance over the film exposed and

always developed the first and last foot on each roll as a precautionary measure.

While we were working under strange conditions, our camera equipment and supplies were not out of the ordinary, and could hardly have been, without a tremendous outlay for transportation over the desert stretches. We used two cameras, Bell and Howell numbers 35 and 36, the same which we used in filming "Abraham Lincoln." Mr. Carewe thought so much of their performance that he bought them for his future productions. We took six reflectors and one mirror to the desert with us as well as 50,000 feet of negative, sending for an additional 25,000 as the picture progressed.

## Sand Was Bothersome

You may be assured that the desert sands did not leave us go unmolested insofar as the cinematographic end of the picture was concerned. There was one stretch in particular of bad weather—a three day sandstorm, during the worst periods of which the camels, without command, would sink to the ground while their drivers huddled up to the shelter that the lee side of the animal offered.

## No Film Scratched

That none of our negative was ruined during these sand disturbances is nothing short of a miracle, as often when changing film I would open the camera and find sand collected in the bottom. But the film was not injured in the least. As a precautionary measure I had Al Green, my assistant who turned second on the picture,



Robert Kuerste, A. S. C., (left) and Al Green, his assistant, working on a platform in a narrow Saharan street. Note the desert types lining the buildings.

take both of the cameras apart each night and clean them for the next day's work. What seemed a paradox, however, was the fact that while none of the film was scratched, we had to use three sets of tripod screws before we left the desert. It seemed that the sand worked into the threads, and, glass-sharp, ground the screws so that they snapped right in half.

Our first stop along the Sahara was at Biskra where we remained for three days after which we proceeded to Touggourt where we put up for four days. Then there was another stay of three weeks at Biskra, a week at Algiers where we made the garden scenes, and a week at El Kantara.

#### *Southern California Light Values*

At all of these places we found that the light values were very similar to those in Southern California and I experienced no trouble from that end. However, the country was very flat and being thus of unbroken lines, it was no easy matter to introduce contrast with only a few palms to punctuate the horizon. The buildings in the desert locations, being made from soil or mud as the adobe houses of old California and Mexico were, almost blended exactly with the rest of the landscape, thus increasing the problem of getting contrast. We solved the matter by working for the shadows which came before and after noon.

#### *French Government Co-operates*

The co-operation which the French government gave us was nothing short of perfect and made possible our obtaining faithful atmosphere that would have been denied us even in such a prolific place as Southern Cali-

fornia. For instance, it is doubtful that if, in the entire United States, we would have been able to gather the more than 300 camels that we used in the production. Likewise, it would have been impossible to assemble the adept horsemen of the Sahara that we had in the instance of the 300 Spais which the French government allowed us to use for three full days. At El Kantara, "the gateway to the desert," we not only were given the shooting privileges of the fort but were allowed to employ 360 of the black Senegalese, 500 camels and 500 Arabs in the scenes made there. All of the Spais who appeared before our cameras were mounted on the fullest blooded Arabian horses which proved magnificent animals for action scenes.

#### *Six Thousand Arabs*

We found the matter of getting "extras" a comparatively simple subject and surely saved a lot of production cost in this respect. At Sidi Okba we used 6,000 Arabs. While they were not the most comprehensive people in the world in falling into the formation that our scenes required, they at least proved a blessing to "Red" Green, my assistant, who soon discovered that they would engage in a battle royal for the honor of carrying the cameras and equipment, even for a distance of several miles, for the munificent tip of one-half franc.

While the Arabs were indifferent to the climate and their surroundings, members of the Carewe company were not so fortunate. In fact, Green, the assistant cameraman, was the only person to escape illness. Bert

(Continued on page 18)

# Klieg Eyes Forever?

By Herbert Stanton Marshall

of the Marshall Optical Co., Los Angeles  
and chairman, committee on public relations,  
California State Association of Optometrists.

Ocular Ailment Known to  
Eskimos. Will Film Play-  
ers Contract Cataracts?

Although he didn't know it by the same title, the Eskimo discovered Klieg Eyes. But a rose by any other name is just as sweet. And so an eye inflammation known in Hollywood as Kliegs, up North of Labrador where a man's a man, etc., would be just as irritable by any other name.

Frankly we don't know how they describe it in their own language North of Labrador but North of Wabash Boulevard, they say it feels like a "sand in the eyes." Today there is no sand where the orange groves used to prosper in Hollywood and there is no sand up there where the nights are six months long.

"Klieg Eyes" was snowblindness in the north pole country, "electric ophthalmia" when the acetylene welder operator worked his trade without eye protectors, and today in the picture studios it is "sand in the eyes" and "Kliegs."

## No Hollywood Monopoly

Evidently "Kliegs" cannot claim to be a purely Hollywood or Culver City malady. Surely, if the Eskimo, the welder, and the actor all suffer the same ocular discomfort, with the same external manifestations and the identical irritations, there must be a cause common to them all.

With the coming of the great super-arcs came "Klieg Eyes" and the diagnosis of the layman and the studio wacker pointed to the fine carbon dust as the cause. Perhaps the feeling of foreign substances in the eye prompted the opinion, which was generally accepted for many years. However, it was found that when arcs were carefully screened, "Klieg Eyes" appeared in the usual way.

## In the Far North

The Eskimo invented his crude snow-goggles and the electric welding trade adopted special lenses to reduce the intensity of illumination. The Eskimo goggle with its narrow slits for vision became the Stenopæic slit eye protector worn in northern countries to check snowblindness. The early goggles for welding developed into absolutely safe industrial goggles with lenses made of glass whose chemical contents gave a protecting color that filtered light of its danger.

But for the motion picture profession, practically nothing has been done to prevent "Klieg Eyes."

If there is a cause common to them all, why not a remedy for them all?

A discussion of remedies must be preceded by a word on causes.

## Ultra Violet and the Skin

If one lies on the beach a half-day, the exposed skin will be burned or tanned to a degree proportionate to the intensity of the sun and the sensitiveness of the individual. The same kind of burned skin or flesh can be obtained without sun's rays by exposure to intense artificial illumination. This man-made sunlight, however, must be very rich in the ultra-violet and infra-red element of the spectrum to cause burning of skin. We may rightfully conclude therefore, that the skin or any delicate membrane will be affected in proportion to the amount of ultra-violet and infra-red that is present (with allowances for varying sensitiveness of different indi-

viduals). Burning of any matter is the result of heat secured by any one of a number of available methods. Burning from light, whether it is solar or man-made, is the result of the heat element in light. These heat elements in light are actinic, i. e., they are capable of producing chemical changes.

## Actinic Power

The powers of actinic light are known to chemists, physicists, optometrists, and other interested in light. The greatest commercial usage of actinic light is photographic, the actual impression being made through the chemical change that transpires on the plate or film when contact with actinic light is made. The actinic elements in light are, of course, the invisible extremes of the spectrum, the infinitesimal wave lengths between the X-ray and visible violet light, at one end, known as the ultra-violet and the longer-waves, the infra-red beyond the visible red at the other margin of the spectrum.

Ultra-violet and infra-red are powerful, though invisible to the eye. Light broken up into its component elements of varying wave lengths will reveal the extremes of the spectrum only through the aid of photography. In addition to sun-burn, ultra-violet is sometimes responsible for "bloodshot" eyes, noticed after a day's exposure to sunlight, on a motor trip for example.

## The British Discoveries

In England, experiments in glass foundries, proved conclusively that certain forms of cataract (the forming of opaque opacities in the lens of the eye) were due to exposure to the hot breath and glare of the furnace, which were rich in ultra-violet and infra-red rays. Sir William Crookes, the eminent British scientist, developed the form of glass that bears his name, in his successful effort to reduce the prevalence of cataract in the English furnace rooms.

## The Studio Problem

To secure safety in motion picture illumination is truly a problem as the elimination or reduction of invisible rays would greatly interfere with successful photography. This will be true until a photographic film can be found that is sensitive to light, free of ultra-violet or infra-red.

"Klieg Eyes" is not as dangerous as other ocular disturbances that are known to be the result of the same underlying cause—excess of actinic rays. Experiments with ultra-violet and infra-red upon animal matter have brought cataract-like formations as a result of extreme exposures. It is too early in the history of moving pictures to state whether or not the over-exposure to light will increase the probability of the acquisition of cataract among members of the profession.

While such a forecast cannot be made without assuming a great deal, it may be rightfully said that no optometrist or oculist would be surprised at such a result.

## Eyesight Undervalued

Eyesight has been undervalued by producers and illuminating engineers. In the days of more sun-lighting and less arc lighting on motion picture stages, Klieg Eyes (Continued on page 13)

# Work Progresses on Building for A. S. C. Offices

Brick Work Reaches Completion. Heavy Demand to Buy Guaranty Offices.



A. S. C. Quarters to Be Masterpiece of Architectural, Technical Perfection.



*Architect's drawing of Guaranty Building, Hollywood, new home of A. S. C. and the American Cinematographer*

Rapid strides are being made in the construction of the new Guaranty Building as which the American Society of Cinematographers has bought a major unit on the top floor to house the future activities of the A. S. C. and of the *American Cinematographer*.

The framework of the structure has been completed and the brickwork has already reached the upper stories. At the present rate of progress, the possibility is that the building will be ready for occupancy by September first, although the Guaranty officers do not vouch for a date earlier than October first.

## Heavy Demand

Judging from a general demand that is being manifested on all sides, all office space in the new building will be sold out within the next several weeks. Virtually every one of the offices in the lower stories already are exhibiting "sold" signs in the windows.

## Los Angeles Recruits

Hal Hardin, one of the staff of Hollywood's edition, reports a demand for space in the new structure that even  
*(Continued on page 17)*



# Drama Treatment Enters Comedy Photography

Comedy Cinematographer  
of Features Must Know  
Dramatic Value in Work.

By **Walter Lundin, A. S. C.**  
*Chief Cinematographer, RKO-28th Street  
Productions*

Much to Do Besides Being  
Master of Trick and Action  
Filming. Very Dangerous.



*Still by Gus Korman*

*An illustration of the type of photography that the comedy cinematographer is given opportunity to produce in the feature comedy—which is quite different from the "straight stuff" in which his efforts formerly were confined.*

Those pioneers who began to observe cinematographic tendencies several years ago were of the unanimous opinion that being a "comedy cameraman" meant an ability to do "trick stuff" and to turn out hard, wire-sharp, black-and-white negative.

At the time they made their observations they were right. But comedies, like other phases of film production, have progressed, and cinematography in comedies has likewise risen to a different plane.

## *Story Subordinate*

In the olden days, comedies, I might say, were objective to an extremity. All action, never a dull moment, kept the audience on the edge of the chair, story and plot always subordinate to gags.

Comedies must still have their gags, but even therewith, this medium of motion picture entertainment is no longer identified with action at any cost—and there is still plenty of action—but has, on the contrary I might again hazard an opinion, begun to stroll on paths of the subjective. By that I mean that comedies of the outstanding class are no longer a series of incoherent situations which, though laughable, were not always quite reasonable.

## *Story Carried Throughout*

No, the feature-length comedy has changed this. There is a thread of story that runs through the channel of humor; there are drama and moments of pathos in the most hilarious of comedies—and all this directly af-

fects the cinematographer who films such productions.

## *Decried to Obscurity*

How often in the old days did the comedy cinematographer look at the work of his fellow artist, the dramatic cinematographer, as it was flashed on the screen, rich in atmospheric effects, and wish that he would have the opportunity of essaying something as pretentious. But unless he would leap to the ranks of the dramatic, he could do little more than wish. Instead, he would go to the studio the next day and find consolation in photographing some particularly hazardous piece of action or in creating some new trick—which, mind you, are not for a moment to be belittled.



Harold Lloyd (right) and Walter Landis, A. S. C., his chief cinematographer. Landis has been photographing Lloyd productions for the past seven years.

#### Public's Tastes

But the majority of that small minority of motion picture patrons who have ever recognized photography in the least, always have been impressed with something "beautiful"—such as lovers under the blossoming trees in springtime, etc., etc. They may have a faint idea that comedy cinematography entails danger to life and limb as well as a knowledge of the most intricate details of the camera, but even with this suspicion they are never able to place it on a plane of comparison with the dramatic.

The feature-length comedy, however, with its plot, its recognition of the subjective as well as the objective, its points of pathos and drama, has changed the outlook of the cinematographer making the same. He is no longer consigned to the oblivion of what is considered as ordinary, but is given the opportunity to step forth with sequences, the photography in which vies with that in dramas for pictorial beauty that arrests the attention of the critically inclined.

#### Atmospheric Treatment

Those dramatic moments, which have been injected into the feature comedy to attract sympathy to the star for instance, may be treated atmospherically—which is just what the comedy cinematographer has been waiting for, for years. He can play

for effects that will appeal to those who are impressed with the pictorially beautiful. By his photography he can show that he has a sense of dramatic values as well as of comedy situations.

#### Versatility Required

All of which calls for the utmost

versatility on the part of the comedy cinematographer. Not only must he be able to "turn his camera inside out" for trick stuff as has so aptly been said, not only must he have the nerves of an iron man, but he must be able to make his work compare with that of the most favorable of his fellow artists who have made their reputations in dramatic motion pictures.

Without committing myself to appraising cinematography in Harold Lloyd productions, I may safely say that it was our endeavor at least to imbue certain sequences of recent Lloyd productions with atmospheric dramatic treatment. I refer in particular to "Dr. Jack," "Grandma's Boy," "Safety Last," and "Girl Shy." If the reader who viewed these productions recalls, it will be remembered that there were not a few scenes in them that were far removed from old-school comedy. They truly were gems of drama and pathos.

#### Dramatic Cinematography

What did this mean for the cinematographer? Should he film such scenes very "contrasty" with plenty of "black and white" as he would do in straight comedy episodes? Or was it his duty to give the sequence the treatment it deserved—and that treatment of course would be dramatic treatment. Clearly there was only one logical thing to be done—leave the beaten path of comedy cinematography.

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Walter Landis, A. S. C., crouching on a platform affixed to the front of an automobile preparatory to shooting Lloyd in dangerous "thrill" scenes.

# Co-operation of the Technical Department

Those who know what motion picture production really amounts to, have long ago realized that the making of a picture is not a one-man proposition. To use a somewhat time-worn but plain illustration: producing a picture is much like putting an army into the trenches—several individuals are needed to perform many duties in order to put one person in the front line trenches.

Among all the various units which go to make up the production personnel of a motion picture, that of the technical department cannot be overlooked. An efficient technical department, guided by a technical director who really knows film production, can save the producer thousands of dollars.

## Delays and Changes

On the other hand, an inefficient technical department can be the cause, by delays and changes, of running up thousands of dollars worth of expense against the producer. How many times has it happened that the director and the entire company are on the set ready to begin work, only to have the cinematographer discover that the set in question defies being photographed due to inherent impossibilities in its construction. One may ask why the cinematographer was not present to prevent the faulty construction. But during the period of high production pressure when the cinematographer leaves the studios late at night and reports back early the next morning, it is a physical impossibility for him to supervise the over-night construction of sets.

## Test Is Filming Qualities

Don't forget that no matter how beautiful a set may be to the eye, it is a dead loss unless it can be properly lighted—and photographed. "Over realism" in designing and painting sets works a great deal of harm. A four-wall set, painted very light, is very beautiful if regarded as one would regard the interior of one's home and would show up well under the illumination of a few Mazda lights. As long, however, as we have to use banks and breadsides to illuminate sets they should be built accordingly.

Building of sets requires something else besides able architectural and skilled labor. It requires, it may be emphasized again, a thorough knowledge of motion picture production. A technical director may be ever so skilled in designing buildings—yet if those buildings, whatever they may be, are of such a nature that they cannot be photographed properly, then what good are they for the production for which they were built? Building sets surely is not an elaborate house building program.

## Fraction of False Work

Of course every one knows that a set is not built to completion as the structure it represents would be. But how many realize that, in probably the majority of cases, it would only be necessary to build a fraction of the false structures and still have all the background required by the action?

## Useless Detail

What is the use of making a wall 30 feet long when only ten feet will be included in the camera's path of

## Improper Construction of Sets Runs Up Waste In Cost of Motion Picture Production

vision? What good is the practice of affecting fresco mouldings when such mouldings are not even included in the line of vision? Clearly the only end that has been served is to waste the producer's money.

## Reflections

The same is true of holding up a company while glass is being removed from doors and windows that open into the scene so that gauze or wire mesh may be substituted—done to eliminate the reflections. Likewise, when there appears in the set a window or a door which the action demands shall be a source of illumination—what a hardship it causes when the door or window in question is built too near to the studio wall or to another set to allow the necessary lighting equipment to be placed

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## Portland Cement Manufacture Shown in Government Vehicle

"The Story of Portland Cement," is the latest addition to the series of industrial motion picture films released by the Department of the Interior, through the Bureau of Mines. This film, which is one reel in length, has been prepared, in co-operation with the Portland Cement Association, in commemoration of the 100th anniversary of the invention of Portland cement in 1824.

The film depicts vividly the quarrying of the raw cement rock, one especially striking scene being the setting off by electrical means of a huge dynamite blast. The loading of the loose cement rock into cars by steam shovels; the pulverizing of the cement rock in giant crushers; and the transporting of the crushed material on belt conveyors are depicted.

Methods of wet and dry grinding of the crushed cement rock are shown. Views are given of the drying of the ground material in kilns for the purpose of driving off water and carbon dioxide.

## Cement Clinker

The spectator is shown how, at a temperature of 2700 degrees F., cement clinker is formed, and it is pointed out that it requires the burning of half a ton of coal to produce one ton of cement.

Views of the cement clinker stored in huge piles are given as well as of the final grinding of this clinker into cement. Laboratory testing methods by which the manufacture of Portland cement is at all times kept under careful chemical control are shown.

## Save Holds Water

An interesting feature is the depicting of the passing of Portland cement through a sieve with 40,000 holes to the square inch and which is capable of holding water. The testing of cement briquettes, to determine whether the material conforms to specifications of the Federal Government and of the American Society for Testing Materials, is shown. Another interesting feature is the employment of intricate mechanical appliances for storing the finished cement in sacks.

Copies of "The Story of Portland Cement" may be obtained by schools, commercial organizations, clubs and similar bodies, by applying to the Department of the Interior, Bureau of Mines, Pittsburgh, Pa.

# The Editors' Lens

- - - focused by FOSTER GOSS

## *An Association for Still Photographers?*

¶ As is pointed out in Gene Kornman's story in this issue and as has been emphasized from time to time in the *American Cinematographer*, proper still photography should be a main cog in the production of any motion picture which is expected to attract public attention. No one knows better than the theatre publicity man how useless an imprudently taken still is. He knows, in too many instances, that only a very modest percentage of stills are found to be of practical value to the newspapers with which he does business.

¶ If, as Mr. Kornman suggests, the stills problem is to be solved by having a capable still photographer a member of every important production staff, then why wouldn't a carefully planned association of still photographers prove of great worth in the motion picture industry? An organization of this sort, with high standards set and maintained, should do for still photography and photographers what the American Society of Cinematographers has done in its particular field.

¶ Worth while associations with serious purposes prove very decided assets to the cinema profession, whether the fact is recognized or not. The meetings at which their members assemble and discuss matters of their calling not only results in the raising of the standard of that particular calling as well as their own efficiency but also works an inestimable good for the industry in general. That the latter statement is not without foundation may be proved, for instance, in just counting over the numerous time and money-saving improvements that have been brought about in cinematography in the past several years.

¶ If a man is interested enough to give up a night every week or two weeks to talk shop, after a busy day's work, that man surely has his calling at heart. When he gathers with his fellow members of the profession, he is not only serving himself but he is serving his employer, whether the latter realizes it or not. For

the discussions that take place during the meeting, and the conversations which are held about this or that effect before or after the meeting, enrich the fund of knowledge of every one of the participants—who, when the occasion demands, can, for the benefit of their employers, put into practical use the effects or economical or "short-cuts" which they have discussed with their fellow members.

¶ So it is that each meeting of societies like the American Society of Cinematographers or of the Society of Motion Picture Engineers in the East places a new brick in the structure of a greater film industry—a structure that is made stronger for those who are providing the means to have it built.

¶ It may be appreciated, then, that a high-calibre association of still photographers should find a place for the good of all concerned in the motion picture profession.

#### *Accredited Names in the Program*

¶ The deplorable part about cutting credit titles is that the managers responsible for the perpetration do not even take the trouble to have the eliminated names inserted in their theatre programs. If the producing company from which the release print was rented knew enough about its business to produce the picture, then surely it must have had some definite reason for prefixing credit titles to the print. Evidently the managers who slash think otherwise.

¶ To make it impossible for the responsible parties not to have any excuse whatsoever for not publishing the accredited names on the theatre program, those names should all be included in the press-book of advertising and publicity matter from which the data for the program is usually assembled. This point is directly in the hands of the studio publicity department, provided proper sanction is present and provided further that the names in the studio copy survive the New York offices which usually take care of the printing of the press-books.

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# Heat Protection of Motion Picture Film

Information on Important  
Cine Film Subject Given

By E. D. Tillyer

From Transactions, Society  
of Motion Picture Engineers

All films used in motion picture projection contain organic materials which will be damaged or destroyed by excessively high temperatures. This applies both to the inflammable and to the noninflammable films; the difference is mainly the kind of damage. One type of film may stand a little higher temperature before damage than another, but both are within what might be called the easily damaged zone.

The heat reaches the film in two ways: first, by conduction and convection; and second, by radiation. In a well-designed machine, this first source of heat should be entirely negligible and is small in almost all machines. The second, radiation, is the source which causes the most damage to the film and is the more difficult to control.

Any ordinary source of light, such as an arc, or concentrated filament tungsten lamp radiates energy of all wave lengths: that is, some short waves (ultra-violet); some longer as the violet, blue, green, yellow, orange, and red of the visible spectrum; and some still longer, known as the infra-red or heat rays which, when strong enough, manifest themselves as heat to the back of the hand or face. No matter which one of these wave lengths falls upon the film, if it is absorbed by the film (i.e., the film is a title or black,) it will appear in the film as heat energy. The only useful part of this energy is in the visible, all the rest is waste energy and objectionable.

If we consider only the visible part of the spectrum, having removed theoretically all the rest, we find that certain parts of the visible appear brighter to the eye than other parts, even when there is the same energy in each part. This region of maximum sensitivity of the eye is in the green at a wave length of 0.55 microns to 0.56 microns, and would be the ideal region for use in projection of "black and white" pictures where protection against heating of the film is desired above all else. Of course, the "white" parts of the film would be green, and absolutely no other colors could be shown. For this region of the spectrum one lumen is 0.0015 watts, or a uniform point source emitting one candle of wave length 0.55 microns to 0.56 microns would require only 0.02 watts. Consequently, if all this energy were absorbed by a film we would have a heating of the film by one candle to the same temperature as it would be if electrical energy of 0.02 watts were put through a resistance in the film.

If we could find a source of light which emitted only monochromatic energy of this wave length (0.55 microns,) we should have a source 100% efficient in the production of light, and consequently 100% efficient in keeping the film cool. This light would be fifty candles per watt at the film and would heat the film very much less than anything known at present. Such a monochromatic source would be valueless for projecting anything but black and white, or rather black and green.

The next best type of illuminate would be a black body at 6000°C, the normal white light. The radiant efficiency of this (Coblentz) is 14% or equivalent to only 0.14 watts per candle or 7 candles per watt. By the proper use of filters eliminating the invisible radiations at the ends of the spectrum, the heating effects at the film of such a source could be reduced to perhaps 0.05 watts per candle. Unfortunately we haven't such an ideal source. Note that this filtering would not increase the efficiency of the illuminate, but merely reduce its heating effect.

The best filter yet made for the elimination of the infra-red radiations is the copper chloride solution in water recommended by Coblentz for laboratory work. This solution can be made so that practically all the infra-red is absorbed with little change in color. Like all absorbers, the solution gets hot in use, bubbles form and finally it boils. It is exceedingly efficient, especially for experimental work. Practically, this filter may be made by dissolving copper chloride in externally dilute hydrochloric acid until a very light green tint is reached or sufficient protection obtained.

The earliest solid filter known to the writer was a polished fine mesh bronze screen such as is used for screens. This is effective, but reduces the light as much as the heat. In stationary pictures the flicker shutter is not used so that a decrease in original light intensity of 50% will give the same intensity to the projected picture. Consequently a loss by the mesh is not so vital and there is some value to this method. This filter is a combination absorber and reflector; it gets hot, but not as hot as an absorber.

There have been many more or less successful attempts at solid heat absorbers for projection work. It is needless to review these and until the "Ferrous" glass was produced by Sir William Crookes, no efficient heat absorbing glass was known. This glass as its name indicates, owes its heat absorbing properties to iron in the ferrous state of oxidation. This is the basis of all present day heat absorbing glasses especially those used in eye protection goggles. It explains why sometimes the hit or miss type of protection glasses are good, but more often valueless. Early experiments showed that this glass when properly selected would protect a stationary motion picture film from destruction by the heat of the lamp as long as it did not break. The next step was the combination of this ferrous property with either a low coefficient of expansion glass, one with a high heat conductivity, or both. This is fairly effective for moderate intensities, and if care is used in cooling, it will not break. It must be remembered that the glass gets hot, very hot, because it absorbs the infra-red.

The glass is greenish in color which is rather pleasing in projection, making the light appear whiter. The results of a few samples are given in Table 1.

(Continued on page 21)

# Sprockets and Splices

By Earl J. Denison

From Transactions,  
Society of Motion  
Picture Engineers

When pictures first began to be used for entertainment, the question of splicing and continuity was given practically no consideration whatsoever, and it was thought that all that was necessary to patch a film was simply to stick the two pieces of film together, and this was done in the crudest manner, without any knowledge on the part of the people who inspected the films of what was required of the film in the theatres. Furthermore, at the time which I mention, everybody was making so much money in the picture business that it overshadowed any damage to film, or damage to presentation through lack of proper handling of film. After everybody got a little experience and more education in the picture game, and profits were not so great, it began to dawn upon the distributors that film damage was causing them great sums of money, as prints were being returned to exchanges practically unfit for further use, and they immediately took the operators to task, (operators, now more properly called projectionists) for the film damage.

In 1919, I was hired by the Famous Players-Lasky Corporation to investigate and, if possible, determine the real cause for the great amount of excess film damage they were having at that time. I visited practically every one of our twenty-eight or thirty offices, at that time, and followed up specific cases of film damage by visiting theatres from which film had been returned, and examining the condition of projectors. I soon learned that although the film was actually damaged in the theatres, the real cause would be found in our exchanges.

I then started an investigation of inspection and splicing conditions in our exchanges, and at the same time making a great many experiments and tests myself. I soon discovered that at least 75% of our damage was due to improper handling and splicing of film in exchanges, caused by ignorance on the part of inspectors, improper equipment and methods. Practically everyone of the exchanges had their own method for making splices, and each individual inspector had her own pet way of making a splice.

At that time most of the splices were made by what is known as the "wet method." That is, the emulsion was moistened in order that it could be easily removed. There was practically no effort made to match the film so that the lap would cover the scraped part, which is so necessary in making a splice. There were no devices in use to make a straight line across the film, neither was there anything used to give a positive register to the sprocket holes.

Also at this time the most common and practically only kind of a splice being made in the exchanges, as well as by the operators, was known, and is still known today, as the "full hole splice." Furthermore, at the time of which I speak, there were no adequate machines or devices on the market for making splices, so I developed several rather crude affairs, in order that the film could be a little bit more speedily handled and at the same time insure a better splice. However, these methods were entirely hand methods and did not seem to be much use in improving our film conditions.

I soon learned that in order to improve conditions, my first job was to standardize on the method, as well as equipment, and we also began an educational program in our exchanges, training inspectors something about the film itself, as well as what was required of the film in theatres, and enlightened them as much as possible along these lines. However, the turnover of the personnel in our inspection departments was so great that we never found the same bunch of inspectors in an exchange on our next visit. Our next step was to put each department in charge of a supervisor. In doing this we endeavored to install the girl who had shown the greatest intelligence in the handling of the film.

These methods improved film conditions considerably, but we were still receiving quite a lot of complaints and our film damage continued.

We had great trouble with film cements. A number of different brands were on the market and practically every brand being used more or less in different localities. We kept on the lookout for some kind of device that would register the film and apply a pressure to the splicing, as we learned that it was practically impossible to make a lasting splice, unless a uniform pressure was applied to it.

Our next step was to install what was commonly known as a patch plate. This was the first real step in improving film conditions. Next we did away with the wet method of splicing and standardized on the dry scraping method, and we soon learned that razor blades were about the worst thing we could use in this work, as the job of removing emulsion from film is a scraping job, and therefore required a scraping edge. So we adopted a standard scraping tool, which was nothing more than a flat piece of flexible steel, ground to a scraping edge, and not to a cutting edge.

With the adoption of these various methods and equipment and continual education, film conditions began to show considerable improvement.

About the time that this work was being carried on, I was continuously experimenting and investigating, not only the film itself, but made hundreds of tests with splices of various widths and different kinds of film cement.

It next dawned upon me that the proper splicing of film consisted of two distinct operations, and unless both were properly used, that neither one meant anything. In other words, no matter if the film was perfectly cut and scraped, we would not get a good splice unless the cement was in good condition, and properly applied to the film. So our next step was to equip our inspectors with a certain type of bottle, fitted with a cork and cement brush that would insure the cement being kept in good condition.

We experimented a great deal with various sizes and kinds of brushes, and we finally adopted a brush so adjusted to the cork that it would dip just the proper amount of cement to cover the scraped part of the film. I think this did more to eliminate buckled splices than anything up to this time.

(Continued on page 77)



## SOLVING THE STILLS PROBLEM

(Continued from page 6)  
Successful in Practice

One could enumerate many more good results from the segregation of the cinematographic and the still departments but the proof of this pudding is that it is successful in practice—at least, among others, it has proved so to the writer in his affiliation with Harold Lloyd. That it is satisfactory to the cinematographer as well as to the company may be testified to by Walter Lundin, A. S. C., chief cinematographer for Harold Lloyd productions, with whom I have had the pleasure to work for the past several years.

### WORK PROGRESSES ON BUILDING FOR A. S. C. OFFICES

(Continued from page 3)

the most optimistic contemplation had not anticipated. Not only have the American Society of Cinematographers and other important motion picture institutions bought quarters in the building, but numerous office holders in downtown Los Angeles buildings are buying, for various reasons, in the Hollywood undertaking. One unforeseen element in this exodus from Los Angeles to Hollywood is the pressure of the traffic congestion in the Angel City that has made necessary rigorous parking restrictions which has seriously hampered the ingress and egress of the clientele of different offices.

#### Best in West

The completion of the new Guaranty Building will mark the opening of one of the most modern buildings in Western America. All offices will be doubled plumbed with hot and cold water, and will be utilized to gas and compressed air as well as electric wiring for heavy duty, such as X-ray or, in the case of the American Society of Cinematographers, for projectors and arrangement for lighting effects as formal occasions may demand.

#### Impressive Interior

The interior of the A. S. C. headquarters will vie with the whole building itself for architectural magnificence. The A. S. C. unit will be especially constructed to meet the demands of the Society and of the *American Cinematographer*. This construction will bring out many innovations which will be a revelation both in architectural and motion picture scientific lines. Homer Scott and Fred Jackson, A. S. C. members, have held lengthy conferences with the architects and contractors in charge of the construction of the building with the result that the A. S. C. quarters are destined to be a gem in the entire building.

#### Strategic Location

The location of the Society's offices are regarded as particularly strategic as they will command a far-flung view of Hollywood, Los Angeles, the Wilshire district, Glendale, Pasadena and miles of surrounding country.

The creation of the Guaranty Building proved especially welcome to the A. S. C. which had long been in the mind of purchasing its own property in Hollywood. However, it was not until the advent of the Guaranty Building that a parcel of real estate presented itself that would measure up to the demands of the A. S. C. which was particularly anxious to buy in a site centrally located in the film capital for the express purpose of securing suitable offices for the expansion of the *American Cinematographer*.

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In fact, the location of the building at Hollywood Boulevard and Ivar streets is being hailed as Hollywood's "Seventh and Broadway"—which is significant to those familiar with Los Angeles real estate, the intersection in question being the busiest in the metropolis of the West. Loew's State theatre is located at this point.

#### KLIEG EYES FOREVER?

*(Continued from page 7)*

was a comparatively rare malady. The safe course to follow today would be to promote the use of more sunlight with a minimum of extreme artificial lighting that is focused directly upon the individual or concentrated upon a small area. More daylight work and less night lighting has also been suggested as a relief measure.

In Southern California even ordinary daylight is rich in ultra-violet. With the white roads, white buildings, beaches and open air life, a program of conservation of vision is considered essential, especially among those whose occupation forces them to face extreme lighting assemblages.

#### Optometrical Relief

Many optometrists and oculists are prescribing Crookes tinted lenses for men and women outside the picture profession, not only for relief from glare, but as a precautionary measure.

The wearing of good quality lenses that filter ultra-violet from daylight or artificial light is to be encouraged. The Noviol and the Crookes have been proven the best

by every test. The Crookes is more pleasant to wear and not unightly like the Canary-colored Noviol, and has therefore achieved popularity in all tropical, and semi-tropical regions, at beach resorts and among all who have learned to eliminate discomfort and danger from potentially harmful super-brilliant light.

#### SHOOTING SHEIK-STUFF ON THE SAHARA DESERT

*(Continued from page 8)*

Lytell contracted the African fever and was out for two weeks, losing 20 pounds in weight, all of which was not so easy for the cinematographer when Lytell picked up the later sequences. In Touggourt I learned that I could not withstand the effects of the change of water and the sudden change of temperature. The first afternoon there found me very sick indeed but I could not feel myself in duty bound to heed the urgings of Mr. Carewe to retire to the hotel, and so we were able to finish the day's shooting without mishap.

#### Sanitary Conditions Primitive

The sanitary conditions in the African towns we visited were not of the best and we had to be continually on guard. Three times a day we washed our eyes in boric water as a protection against the flies which are of a much more phlegmatic variety than those with which we are acquainted in this country. As Victor Milner, A. S. C., once mentioned in one of his articles, the Arabs will not disturb them but allow them to prey up-

on their hands and faces at will. In fact, I have seen flies work under both the upper and lower eyelids and crawl about thus, without the Arab against whom this indignity was being perpetrated even so much as raising his hand to relieve what surely must have been his annoyance. This peculiar form of religious trait results in blindness and horrible disfigurement that is in evidence on all sides.

#### *Interiors Made in France*

After serving five weeks on the Sahara, we went on to Paris to finish the production and make the interiors. We worked at the Eclair Studios, at Epinay, 15 miles out of Paris. Conditions there, it must be admitted, were not of the sort that are most helpful to the cinematographer in simplifying his work. I was hard put to offset my handicap of a dearth of lighting equipment which in the whole consisted of four 50 ampere spots, three banks of Cooper Hewitt tubes and one Sunlight arc. The breach was filled somewhat dimly by four big steel frames, each of which contained six common street arcs. The contraptions were about as easy to handle as the Woolworth building. If diffusers were applied the source of light became useless and if they were not applied the eyes of the cast suffered.

#### *Lighting Difficulties*

The French electricians, who were handsomely rewarded on a scale of one dollar per day, were not of the sort to make the task simpler. They were not the most rapid workers in the world, could speak no English, and after much pleading, Mr. Carewe finally persuaded them to take an hour and a half instead of the customary two hours and a half for lunch. After I had used the greatest of care in arranging the lights for the effects sought, the electricians, checking the carbons, would move them in so doing and, having moved them, would never take the trouble to replace them in the proper position. Remonstrances only brought "what's-it-all-about" expressions on their faces.

I was able to offset the diminutive 90 by 40 foot size of the stage (which was almost all covered with our set) and the handicap of the illumination by painting the set in a non-absorbing ivory which represented perfectly the color of the architecture on the Sahara. Sets, it must be said, were constructed very inexpensively; a richly appearing apartment set only cost \$56 in United States money.

The executives of the studio, at which comedies were produced almost exclusively, could not understand the results that we were getting from our negative. They were accustomed to giving theirs only three minutes of development but when they learned that Bud Courcier, who was handling our negative, was giving it 12 minutes they were astonished although they admitted the difference between their very hard stuff and the quality that we turned out.

We finished our work at Epinay with a rush, working up to nine o'clock of the night before the day of our departure which was at noon. During this last day we shot more than 3,000 feet of scenes that could not be cut from the pictures under any circumstances, with two actors who did not accompany us to America but remained in Paris. The film was not developed until we reached New York, but for that matter we were so busy that we had been working three weeks in Paris before we viewed the final scenes that we had taken on the Sahara.

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# Filming a Ghost City



Gold Rush Days of Twentieth Century Leave Deserted "Ghost Cities" in their Wake



*The house that champagne built—that is, champagne bottles which, piled like bricks, make up the walls. Hobbs, the star, Al Davis, director, and Finian Rock inspecting the "bricks."*

An interesting account of the "ghost cities" left in the wake of the gold rush in Nevada is told by Alois Heimerl, A. S. C., who has returned to Hollywood after filming an Al Davis Production, Al Davis directing, at Rhyolite, Nevada.

Heimerl explored the remains of the ghost city in the making of "Mavericks," which Al Davis directed from the Saturday Evening Post story by Carl Clausen, who tells of a lone prospector who waited for a "come-back" of the dead mining town.

"Rhyolite," Heimerl explained, "is one of the 'ghost cities.' It sprang into existence in 1904 and struggled along with a population of 75 people for a few months. Then a rich strike was made after which prospectors poured in from all parts of the world.

"In less than four years the population exceeded 55,000. At the present time there is one lone prospector living there. The railroad track has been pulled up but the depot remains. It was built at a cost of \$25,000.

## *Desks in Original Crates*

"The schoolhouse is still standing. It cost more than \$20,000 to build. Some of the members of the company

prowling around in the building found schooldesks in the basement still in their original crates.

"Part of the story takes place around the world famous Shoshone Mine which gave out over ten million dollars worth of gold. This was the first film company to invade that part of the country.

"Every exterior in the picture has never been photographed before. The company also journeyed to Chloride Cliff. From this point, the highest point and the lowest point in the United States were photographed—namely, Death Valley, 212 feet below sea level and Mount Whitney 14,985 feet above. This is incorporated in one shot—a distance of 82 miles.

## *Signs of Former Times*

"In some of the scenes will be seen Champagne bottles bearing the date of 1900. The town is in ruins and scattered all over the streets were found beds, stoves, a coffin, telegraph poles, beer bottles and stock certificates by the thousands. There is a house built entirely of bottles thrown out of the famous '66' saloon. This saloon employed six bartenders working on eight hour shifts, 24 hours a day. The owner of this place is living in Beatty, Nev., where the company was staying. He in-

formed us that it was impossible to clear out the place and the barroom was only swept out once in fifteen months."

The interiors of the Davis production were made at the Mayer-Schulberg studios. Besides Davis and Heimerl, the company included Vivian Rich and Hayford Hobbs, co-stars; Milton Ross, James Williams, assistant director, and C. Glaise, technical director.

# CO-OPERATION OF THE TECHNICAL DEPARTMENT

(Continued from page 11)

behind them. And what unnecessary waste has resulted from the "over-aging" of sets through a too liberal use of a spray gun.

Should it be necessary for the technical department to be instructed as to what construction will allow shooting and what will not? Granted that they know what the action is to be, shouldn't it be a comparatively elementary matter for them to bring about construction that is photography-proof—if they really know their business? And doesn't it seem fundamental that, in order to work successfully in motion pictures, the technical department should know just what can be photographed and what cannot be photographed?

If the technical department's knowledge is not specialized enough to include a recognition of all ramifications which go to make up production economy without a sacrifice to art as will appear in the finished picture, then why don't the head of the technical department consult the cinematographer as to photographic possibilities before time and money are poured into a set that must ultimately be changed because it will not allow filming?

There is no excuse for the wholesale reconstruction of sets. If the technical department will not, from within itself, take cognizance of the possibilities and impossibilities of lighting and photography, then it should be wise enough to consult some one who knows, and that is the cinematographer.

# HEAT PROTECTION OF MOTION PICTURE FILM

(Continued from page 15)

TABLE 1

Heat Absorbing Glass 2 mm. thick

Sample No.	Final		Total energy	
	Trans.	Abs.*	Trans.	Abs.*
1	84%	9%	64%	36%
2	83%	10%	36%	46%
3	83%	13%	40%	57%
4	83%	13%	37%	60%
5	71%	23%	23%	75%
6	69%	33%	14%	85%

\*Corrected for surface reflection to compare actual glass. Measures made with 200 watt Type C, Mazda Lamp.

The lighter glasses such as Nos. 1 and 2 would be of little value in film protection, but are useful in spectacles. Nos. 3, 4, 5 and 6 would be effective in small projection machines with a thickness of 2 mm. With higher power lamps, a thickness of double that given would prove very effective, providing some means were devised to dispose of the absorbed heat. Otherwise, re-radiation would occur and the film would be heated.

Another type of protection filter is a thin metallic film. Here we have both absorption and surface reflection, the relative amounts depending upon the metal used and its state. This metal must be supported by something

## —from India

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I want back numbers from October, 1921 to December, 1922, also, for which I am sending \$3.00 by postal money order, and kindly send the back numbers above mentioned, at your earliest convenience and oblige.

My brother and I are receiving *American Cinematographers* regularly at present and kindly let me know before our subscriptions expire, so that we may be able to renew the same in time. We find your journal excellent on the subject.

Apologising for troubling you and thanking you in anticipation,  
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transparent. Pyrex glass is good, and fused quartz is equally good, but more costly. The only requirement is that the support stand a moderate heat without danger of breaking, not nearly as much heat as with Ferrous glass absorbing filters. The optical properties of massive metals are given in any book on physical optics, also corresponding results for certain states of thin or diffused metals were worked out theoretically by Garnett in the Philosophical Transactions of several years ago.

The films of interest for motion picture protection are too thin to be treated as massive metal and consequently we have wide departures from mass theory. It makes little difference how the thin film is obtained, optical results are the same provided the same physical state and the same degree of purity exists. The most uniform films so far have been obtained by cathodic deposition in a high vacuum, or by vaporization. Usually a combination of both is used as the simplest and easiest practical method. Ceramic paints usually give spotty results and often produce diffuse films of widely different optical properties.

Many metals may be used for protection purposes, but copper and gold are the most promising, with gold having the preference because of permanence and reproducibility.

Somewhat of a mean between the radiant efficiency and the true efficiency of a source should be used in determining heating effect on the motion picture film. As more data are available for true efficiency (Ives, Physical Review, 1915) this will be quoted, in table 2 omitting the last figures and adding watts per candle.

TABLE 2

Type of Illuminant	Lumen Can.'s Watts per sq. in. candle	per sq. in. candle
Yellow flame, Open arc, 10 amp. D. C.	45	16 0.28
Mazda C, 400 watt, 20 amp. 0.5 w. p. c.	30	16 0.6
Mazda C, 100 watt, multiple 0.7 w. p. c.	15	12 0.8
Carbon arc, Open arc, 9.6 amp.	12	10 1.0
Tungsten Vacuum, 125 w. p. c.	8	07 1.4

As previously stated, the measurements of the energy transmissions of the film protection glasses were made with an energy spectrum from a 200 watt, Mazda C at 0.8 w.p.c. which corresponds very closely to the 500 watt of 0.7 w.p.c. and as an approximation we will apply filter values given to these lamps for several glasses and gold films, starting with one watt of energy at the source.

TABLE 3

Sample Transmitted	Energy Transmitted	Energy Filter	Mazda 400	Mazda 100	Carbon Arc
cp	cp	cp	cp	cp	cp
1	40	2.9	7	2.5	5
6	34	2.2	16	10	7
17%	20	1.9	9	0.9	3
17%	65	0.8	16	0.4	0.7

This table (3) gives, first, the watts (energy) transmitted by the protection filter for one watt initial energy. This first column (cp) under each type of illuminant is the candle power per watt initial energy; this always shows a loss, as unfortunately all these filters absorb some visible energy. The second column (cpw) gives the candles per watt of energy which reaches the film, in other words the light for one watt energy heating effect at film.

This computation is only approximate and is an indication of what may be done with filters and the future trend of development. With the Mazda C lamp properly screened, we have a means of avoiding the heating of the films as well as if we had a black body radiating at 6000°C. Therefore, it is useless to try to run a lamp at over voltage and obtain a corresponding protection.

Heat absorbing glass, No. 6, gives almost as satisfactory protection as a 5% gold film, but, except with small sources, it very soon gets entirely too hot and re-radiates heat. The film reflects the heat and remains fairly cool. For extreme protection a heavy gold film is even better than the 5% film given. Probably with increased skill in production these results will be improved. The data here given are the ordinary run without selecting specially good samples, but all bad samples were rejected as usual.

Note—There are three patents controlled by the American Optical Co. covering the use of these screens for motion picture film protection.

## SPROCKETS AND SPLICES

(Continued on page 17)

We also discovered that a great deal of our damage was due to the splices being too wide to conform to the periphery of the sprocket wheels, and the wide splices that we were making gave too much leeway in cutting the splices within the limits required by the sprocket wheels. We therefore changed our type of splicing and started making the splices between the sprocket holes, which at least insured us that the splices would not be too wide. We soon learned, however, that the projectionists had all learned to make a full hole splice and it was the only type of splice considered by them, strong enough to pass the projector without breaking, and in view of the fact that managers would not stand for breaks during projection, the projectionists began removing all of our splices and making the full hole splice, generally very wide, wider than our original splice, and the use of too much cement caused the splices to invariably buckle and when the film was returned to the exchange, it was found necessary to remove about 75% of the projectionist's splices. We soon learned that we had developed a splicing battle between the inspectors and projectionists, and realizing that the only two people actually handling the film were the projectionists and inspectors, we decided to give the projectionist the kind of splice he wanted, so we went back to the full hole splice and used more pains and care than ever before in keeping the splices narrow. We found it was better to give the operator the splice he wanted than it was to be continually cutting the film at the point of splicing, even though we felt that it was not the proper kind of splice.

In the meantime the laboratories had adopted the Bell & Howell Negative Splicing Machine, which made a splice about 1-32nd of an inch wide, or about the width of the frame line. The laboratories found it necessary to keep their splices narrow, some of them having trouble in printing machines with hand made splices.

These splices worked so well in negatives that someone had the happy idea that they would be good for positive, so they started making a splice in the positive with the Bell & Howell machine, and almost immediately a cry went up all over the country that the splices were all falling apart. A quick and thorough investigation of this proved that their cry was well founded, and that the splices were not sufficiently wide to stand up under projection conditions. But the splice worked so well in the negative, that finally certain laboratories asked the Bell & Howell people to adjust their machines for a positive

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## WILLIAM A. JOHNSTON

Editor—Motion Picture News

(A Recognized Authority on Picture Values)

had this to say in his issue of April 12 (Page 1624)

The fine quality of the art prints for the premiere of "The Thief of Bagdad" in New York and the key cities—and "Dorothy Vernon of Haddon Hall" has merited wonderful praise in each locality. The Rothacker-Aller Laboratories who made these art prints are naturally highly elated. And here is our testimonial. The laboratory work on "The Thief of Bagdad" (we have not seen "Dorothy Vernon") is the best we have ever seen. The Rothacker-Aller people may well feel proud of their justly famous slogan: Look Better—If Not Longer! . . . and this is surely pretty good evidence of the real cooperation we give to Cameramen whose good judgment and experience justifies their choice of—

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splice. This was done and the splice then made in this machine, in our laboratories, was practically the same width as we had made by hand in our exchanges, but which we had to discontinue for reasons already given.

During all of this investigation, experiments and education, we learned that there were only a very few causes for poor splicing, and if we entirely eliminated these causes, it would practically eliminate film damage, as well as greatly improve presentation of pictures in theatres.

These causes can be readily summed up as follows:

- 1—Failure to entirely remove the emulsion from the surface of the splice.
- 2—Excess scraping of celluloid after emulsion had been removed making the base too thin.
- 3—Cement in bad condition causing splices to come open.
- 4—The use of too much cement causing splices to buckle.
- 5—Imperfect registration of the sprocket holes.

We eliminated the most of these faults by various methods and devices until we were satisfied that we had gone as far as was humanly possible to do so, in the manual splicing of films.

And about this time the Standard Film Laboratories

of Hollywood got the Bell & Howell people to adjust their machines so that they would make a full hole splice and narrow enough to conform to the periphery of sprocket wheels, as the standard laboratories had learned exactly as I had learned, that the wide splice was bad, but that the operators desired a full hole splice, and it was practically impossible to make this splice by hand.

After installing several of these machines I closely watched results of this new splice, and soon found these splices were standing up far beyond our fondest hopes, that the operators were accepting them and were not cutting them out, and our films were not receiving anywhere near the amount of damage they had been.

We recently completed a 60-day test of the Bell & Howell machine in one of our exchanges and the results were so satisfactory that it is now only a question of time until we install splicing machines in all of our exchanges.

In our educational work and inspection of inspectors, we never lost sight of the fire hazard and did everything in our power to keep the fire hazard in our exchanges down to a minimum.

Last fall I made a one reel picture showing the right and wrong way of splicing and handling of films in our exchanges, and we are of the opinion that the picture did more to educate our inspectors in the proper handling of film, than anything we had done before.



## Until the Guaranty Building Opens

Because of their location for several years at 6372 Hollywood Boulevard, the American Society of Cinematographers are still receiving communications directed to the latter address.

Attention is called to the fact that, until completion of A. S. C. offices in the new Guaranty Building, the Society's temporary headquarters are at 1103 North El Centro Avenue, Hollywood.



(Continued from page 10)

graphy and make the camera lens see drama. And that is what we tried to do in shot after shot.

But no matter how much drama he must have in his stock of wares the comedy cinematographer is, after all, essentially a trickster, and there is scarcely a comedy that passes that he is not called upon to run the gamut of camera intricacies. And never does he escape the element of personal danger. Whenever a member of the cast takes his life into his hands, then the cinematographer, you may be assured whether the audience realizes it or not, is taking a similar chance. Every comedy cinematographer knows this and can prove it by his own experiences. I personally can bear testimony to the statement by virtue of the seven years I have spent with Harold Lloyd—and who can count the narrow escapes that this star has

### DRAMA TREATMENT ENTERS COMEDY PHOTOGRAPHY

had in his comedies in that time!

"Safety Last" of course was one succession of perils, and you can be assured that the cinematographer was immediately present in all of the perils.

Throughout the entire shooting of the thrill action in "Safety Last," there was an element of danger not only for Lloyd but for the cinematographer. In the scenes showing Lloyd as a "human fly," climbing up the side of a building, the Bank of Italy Building, Los Angeles, was used. This building is twelve stories high. In order to shoot down on Lloyd as he was ascending, it was necessary to erect a platform that projected out over the street. It extended something like ten feet beyond the building

limit, and you can believe me, it was quite a sensation following the climb from that height.

Although in seven years with Lloyd, we have escaped with nothing more than minor injuries, we believe it is only because the fates have been kind to us. We had a very narrow call in shooting some of the scenes in "Girl Shy" when Lloyd drove a team of lightning fast horses down the main streets of Los Angeles. One of our shots showed the galloping horses flying clean over the camera. We mounted the camera in a manhole on Grand Avenue. Several times the scene was made but not perfectly. The last time we attempted it, one of the horses swerved just a little as it approached the manhole, and it was only by the merest of chance that the camera and its manipulator escaped collision with flying hoofs.



Stephen S. Norton, A. S. C., is filming a series of comedy dramas for Universal, Jack Dawson directing. These productions are practically all trick work, using persons and clay models working together in many of the scenes. The first vehicle of the series is as yet untitled.

Victor Millner, A. S. C., has finished the filming of "The Red Lily," Fred Nibbe's latest production.

Reginald Lyons, A. S. C., has finished shooting "Forbidden Island" at the Russell Studios, George Holt directing. Carl Miller and Jim Mason were in the cast.

James Van Trees, A. S. C., has begun the filming of "Single Wives," an eight reel First National production starring Corinne Griffith. George Archambault is directing.

George Schneiderman, A. S. C., has returned to Hollywood after a long trip in Western locations for the filming of an important forthcoming Fox feature production.

John Arnold, A. S. C., is photographing Hobart Henley's latest production for Metro-Goldwyn-Mayer.

André Barlatier, A. S. C., has finished the filming of a Gorman production at Goldwyn.

H. Lyman Broening, A. S. C., has completed "Being Respectable," a Warner Bros. production directed by Phil Rosen.

Joseph Bretherton, A. S. C., is fulfilling a busy schedule in filming current Fox productions.

Norbert Brodin, A. S. C., is shooting Frank Lloyd's latest First National production. Brodin's work in "The Sea Hawk" is bringing him praise from all sides.

Karl Brown, A. S. C., is photographing "Merton of the Movies," James Cruze's latest feature for Paramount.

Al Gilks, A. S. C., is filming "The Female," Sam Wood production for Paramount. Betty Compson is starred.

Arthur Edison, A. S. C., will photograph "The Lost World" for First National.

Tony Gaudio, A. S. C., has completed the cinematography in John M. Stahl's latest production, which he photographed by special arrangement between Louis B. Mayer and Joseph M. Schenck, producer of Norma and Constance Talmadge features for which Gaudio is chief cinematographer.

Frank B. Good, A. S. C., is completing the camera work on the latest Jackie Coogan production.

Bert Glennon, A. S. C., has completed the camera work on his latest Paramount vehicle co-directed by Frank Urson and Paul Irlbe under the supervision of Cecil B. De Mille.

Ernest Haller, A. S. C., will film "Potash and Perlmutter in Hollywood," one of the outstanding productions for the coming season.

Fred Jackman and Homer Scott, both A. S. C. members, have been engaged by First National on a special assignment for some intricate cinematographic undertakings. Though a successful director, Jackman is still in demand as a master of cinematographic intricacies, for which he is famous in motion picture production quarters.

Robert Kurlle, A. S. C., has returned from a location trip with Edwin Carewe with whom he journeyed to Northern California to scout locations for Carewe's next production.

Kenneth MacLean, A. S. C., is shooting Fox productions. MacLean and Philip H. Whitman, A. S. C., were associated with Arthur Edison, A. S. C., in the filming of Douglas Fairbanks' "The Thief of Bagdad."

Paul P. Perry, A. S. C., is photographing Jack Pickford's latest production at the Pickford-Fairbanks studio.

Sol Polito, A. S. C., is photographing "The Siren of Seville," a Hunt Stromberg production starring Priscilla Dean.

Bob Doran, A. S. C., has just finished the filming of Will Rogers' last production for Hal Roach prior to Rogers' returning to New York and the Follies. Doran is now photographing "The Spat Family" series for Hal Roach.

Floyd Jackman, A. S. C., has finished filming the Hal Roach feature production, "The Up-State Slicker" a comedy drama directed by Ted Wilde and Fred Guisl, featuring Glenn Tryon and Blanche McHaffey.

## Howland and Dewey Aides Explain Kodascope to A. S. C.

The American Society of Cinematographers open meeting of May 6 was the occasion of an explanation by Messrs. Overton and Hurst, of Howland and Dewey Company, of the operation of the Eastman Cine' Kodak and Kodascope.

The meeting proved one of the most interesting of the year. Following Mr. Overton's address, a general discussion took place relative to the mechanical details of the new Eastman creations.

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Willy, William—Huntington Studios  
Willy, Arthur C.—Huntington

Members of the American Society of Cinematographers are held every Monday session. On the first and the third Monday of each month the next meeting is held, and on the second and the fourth the meeting of the Board of Governors.

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